

Annual Report for Smith-Lever Funded Projects

Project Title:	SWD Trap Network		
Principal Investigator:	Juliet Evelyn Carroll		
Project Start:	10/1/2014	Project Term:	9/30/2017
Report Fiscal Year:	2016		

Plan of Work Area(s): General Production Practices

Executive Summary: A New York State monitoring network for the invasive insect spotted wing Drosophila (SWD) will be set in June and monitored each year by Extension educators and faculty until first sustained trap catch is noted. Results from the trap network will be uploaded to a NY distribution map, the SWD blog, and in newsletters to inform fruit farmers of risk to fruit crops.

Progress Summary: In 2016, 117 traps were monitored by 15 cooperators in 42 sites in 25 NY counties. Most locations had four traps, two in the crop and two on the crop edge. The traps used to catch the spotted wing Drosophila flies were a new product available from Scentry that included the trap and lure with soapy water as a drowning solution. Research on traps and lures in NY identified this as the best to use in 2016. Traps were set in early to mid-June. Within the 42 sites in the network, diverse crops were monitored, though mainly raspberry and blueberry: 18 sites included raspberry, 17 blueberry, three blackberry, two grape, one strawberry, and one stone fruit.

First trap catch and sustained trap catch were reported for many sites in the network in June 2015. This is the earliest arrival of SWD in NY since SWD was verified in NY in fall 2011. Eggs of SWD were found in summer raspberries and blueberry samples collected and assayed by salt flotation by cooperators in the network in June. First catch occurred on June 8 in Suffolk County, in a blueberry and blackberry planting. The last site to report first catch was in Steuben County on August 13. Trap catch was reported to a mapping site, www.eddmaps.org/swd/. First trap catch of SWD across all sites spanned a period of 66 days in 2016, similar to 2015 and 2014, when the whole wheat dough lure was used.

SWD trap catch reports were posted on the SWD blog, blogs.cornell.edu/swd1/, and to the SWD EDD MapS NY distribution map, www.eddmaps.org/swd/. New subscribers were added to the SWD blog during workshops and presentations on SWD throughout the year. Current subscribers total 248, primarily growers. Extension educators included SWD trap catch information in their newsletters.

Data from the SWD monitoring network is shared with iMap Invasives for the NYS Department of Environmental Conservation. This helps track invasive species occurrences across New York State.

Expected and Observed Impact/Outcome: For growers to protect susceptible fruit crops from SWD, in the absence of new knowledge and tools, they must treat repeatedly with insecticides throughout the harvest period resulting in significant economic costs from chemicals and fuel. When insecticides fail or are not used, SWD destroys the crop, growers cease harvesting and lose considerable revenue. The main outcome has been being able to avoid and reduce insecticide applications by supplying accurate, targeted and timely information about the presence of SWD in New York, especially in summer raspberry and early blueberry varieties. We have preliminary data suggesting growers can hold off spraying crops until SWD is found in traps in a regional location (i.e. County). We implemented rapid-delivery of statewide SWD monitoring information for Extension and grower audiences. The positive impacts of deploying a SWD trap network are that fewer insecticide applications would be used by growers, crops would be better protected from SWD, and crop losses would be minimized.

Evaluation Approaches/Methods and Results: We have done preliminary analysis of SWD trap catch results across the network and compared these to crop damage assessments. There were cases of trap catch coinciding with fruit infestation, trap catch occurring ahead of fruit infestation, and trap catch occurring after fruit infestation. The most useful results for spray decisions appear to be from traps that are situated as close as possible to the at-risk field, and the spatial relationships of field location associated with trap site density in a county or region are being examined more closely by research laboratories with which we are sharing our data, in order to better deploy an effective network. For instance, if there is only one raspberry grower in a county or region, it will be best for that farm to monitor traps, pay close attention to reports of trap catch from the surrounding region and potentially base spray decisions on crop maturity, regardless of trap catch reports.

The value of the trap network reports is greatest for the earlier ripening berry crops, such as early-season blueberry varieties and summer raspberry. For late maturing crops, such as fall raspberry and blackberry and late-season blueberry, the crop may already be at risk and trap catch reports would serve to underline the need for protecting crops with insecticide programs. For early season crops, the trap network can provide an effective early warning, but more analysis and additional years of data are needed.

The project group met via email before the trapping season in 2016. Fifteen cooperators agreed to collaborate on the project, monitoring 117 traps at 42 sites in 25 counties. Information was provided on the type of trap to be used, how to report trap data to the mapping system, Eastern Spotted Wing Drosophila Volunteer Monitoring Network (SWD*VMN), www.eddmaps.org/swd/, and how to report trap data for inclusion in the SWD blog. Most suggestions for improvements related to the SWD distribution map generated by the reporting system and as a result, a new color scheme was used for the map.

The Spotted Wing Drosophila blog, <http://blogs.cornell.edu/swd1/>, tracks subscriber numbers. Subscribers to the SWD blog rose 43% from 2014 (159 subscribers) to 2015 (228 subscribers) and an additional 9% (20 people) subscribed in 2016.

First trap catch occurred over a nine- to ten-week-long period, from June 8 to August 13. SWD was caught earlier this year than in prior years, but the hot and extremely dry weather across New York State appears to have benefited early- and mid-season berry crops, which suffered lower infestation rates in July than might have been expected from the early arrival of SWD. However, later in the summer, fall raspberries and late-maturing fruit were hard hit and growers had a difficult time maintaining insecticide coverage and control.

Although SWD might show up around the same time each year in a particular location, this doesn't often hold true. For instance, the location in 2015 at which my program caught SWD first was among the last of our monitoring locations to catch SWD this year. The long length of time, 66 days, over which first trap catch occurs across NY in 2016 and in prior years (56 days in 2015, 56 days in 2014, 76 days in 2013) provides evidence that SWD arrival in berry plantings across NY isn't synchronous. For this reason, in addition to trap catch reports, growers must consider crop maturity and crop susceptibility to infestation when formulating management decisions.

Diverse Audiences Reached:

We indirectly served the interests of diverse audiences. The use of webpages to deliver SWD information and education is non-discriminatory and therefore may reach audience members of under-represented groups. A majority of berry farms in NY are operated by small farms or hobby farms, many of which may be operated by diverse audiences. "Cornell University is an equal opportunity, affirmative action educator and employer." is posted on the Cornell Fruit Resources webpages where the SWD resources will be published.

Multi-State Activities:

Publication(s):

Carroll, J. Herkimer County finds SWD. Spotted Wing Drosophila. Cornell University, 23 September 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/09/23/herkimer-county-finds-swd/>

Carroll, J. SWD and sour rot of grapes. Spotted Wing Drosophila. Cornell University, 23 September 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/09/23/swd-and-sour-rot-of-grapes/>

Carroll, J. 2016 Trap Network Wrap-up. Spotted Wing Drosophila. Cornell University, 30 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/30/2016-trap-network-wrap-up/>

Carroll, J. Steuben County first & sustained catch. Spotted Wing Drosophila. Cornell University, 25 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/25/steuben-county-first-sustained-catch/>

Sweet, S. and Carroll, J. 2016 Drought Survey – NY & Northeast. Spotted Wing Drosophila. Cornell University, 10 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/10/2016-drought-survey-ny-northeast/>

Sweet, S. and Carroll, J. 2016 Drought Survey – NY & Northeast. You're NEWA. Cornell University, 10 August 2016. Web. Accessed 10 October 2016.
<http://blogs.cornell.edu/yourenewa/2016/08/10/2016-drought-survey-ny-northeast/>

Carroll, J. Clinton County sustained catch. Spotted Wing Drosophila. Cornell University, 9 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/09/clinton-county-sustained-catch/>

Carroll, J. Essex County first catch. Spotted Wing Drosophila. Cornell University, 9 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/09/essex-county-first-catch/>

Carroll, J. Onondaga County sustained catch. Spotted Wing Drosophila. Cornell University, 9 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/09/onondaga-county-sustained-catch/>

Carroll, J. Orange County first and sustained catch. Spotted Wing Drosophila. Cornell University, 5 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/05/orange-county-first-and-sustained-catch/>

Carroll, J. Seneca County first and sustained catch. Spotted Wing Drosophila. Cornell University, 5 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/05/seneca-county-first-and-sustained-catch/>

Carroll, J. SWD found in St. Lawrence County. Cornell University, 2 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/02/swd-found-in-st-lawrence-county/>

Carroll, J. IPM Climate & Weather Conference. Spotted Wing Drosophila. Cornell University, 1 August 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/08/01/ipm-climate-weather-conference/>

Carroll, J. Onondaga County first find. Spotted Wing Drosophila. Cornell University, 27 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/27/onondaga-county-first-find-2/>

Carroll, J. Albany County sustained catch. Spotted Wing Drosophila. Cornell University, 21 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/21/albany-county-sustained-catch/>

Carroll, J. Genesee County sustained catch. Spotted Wing Drosophila. Cornell University, 21 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/21/genesee-county-sustained-catch/>

Carroll, J. Niagara County sustained catch. Spotted Wing Drosophila. Cornell University, 21 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/21/niagara-county-sustained-catch/>

Carroll, J. Orleans County sustained catch. Spotted Wing Drosophila. Cornell University, 21 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/21/orleans-county-sustained-catch/>

Wallingford, A. and Carroll, J. SWD egg laying – extreme drought and heat. Spotted Wing Drosophila. Cornell University, 21 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/21/swd-egg-laying-extreme-drought-heat/>

Carroll, J. Genesee County first find. Spotted Wing Drosophila. Cornell University, 15 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/15/genesee-county-first-find/>

Carroll, J. Saratoga County sustained catch. Spotted Wing Drosophila. Cornell University, 15 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/15/saratoga-county-sustained-catch/>

Carroll, J. Washington County sustained catch. Spotted Wing Drosophila. Cornell University, 15 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/15/washington-county-sustained-catch/>

Carroll, J. Register now! Cornell Fruit Field Day. Spotted Wing Drosophila. Cornell University, 13 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/13/register-now-cornell-fruit-field-day/>

Carroll, J. Clinton County first find. Spotted Wing Drosophila. Cornell University, 12 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/12/clinton-county-first-find-2/>

Carroll, J. Dutchess County first & sustained catch. Spotted Wing Drosophila. Cornell University, 12 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/12/dutchess-county-first-sustained-catch/>

Carroll, J. Erie County first find. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/erie-county-first-find-2/>

Carroll, J. Rensselaer County first find. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/rensselaer-county-first-find-2/>

Carroll, J. Saratoga County first find. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/saratoga-county-first-find/>

Carroll, J. Sustained trap catch – many locations. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/sustained-trap-catch-many-locations/>

Carroll, J. Tioga County first find. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/tioga-county-first-find-2/>

Carroll, J. Wyoming County first find. Spotted Wing Drosophila. Cornell University, 8 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/08/wyoming-county-first-find-2/>

Carroll, J. Schuyler County first find. Spotted Wing Drosophila. Cornell University, 1 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/01/schuyler-county-first-find-2/>

Carroll, J. Cayuga County first find. Spotted Wing Drosophila. Cornell University, 1 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/01/cayuga-county-first-find-2/>

Carroll, J. Livingston County first find. Spotted Wing Drosophila. Cornell University, 1 July 2016. Web. Accessed 10 October 2016.
<https://blogs.cornell.edu/swd1/2016/07/01/livingston-county-first-find/>

Carroll, J. Wayne County sustained catch. Spotted Wing Drosophila. Cornell University, 30 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/30/wayne-county-sustained-catch/>

Carroll, J. Plan to attend the Cornell Fruit Field Day! Spotted Wing Drosophila. Cornell University, 30 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/30/plan-to-attend-the-cornell-fruit-field-day/>

Carroll, J. Ontario County sustained catch. Spotted Wing Drosophila. Cornell University, 28 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/28/ontario-county-sustained-catch/>

Carroll, J. Yates County first find. Spotted Wing Drosophila. Cornell University, 28 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/28/yates-county-first-find-2/>

Carroll, J. Ulster County first find. Spotted Wing Drosophila. Cornell University, 24 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/24/ulster-county-first-find-2/>

Carroll, J. Wayne County first find. Spotted Wing Drosophila. Cornell University, 22 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/22/wayne-county-first-find-2/>

Carroll, J. Albany County first find. Spotted Wing Drosophila. Cornell University, 22 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/22/albany-county-first-find-2/>

Carroll, J. Niagara County first find. Spotted Wing Drosophila. Cornell University, 20 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/20/niagara-county-first-find-2/>

Carroll, J. Ontario County first network find. Spotted Wing Drosophila. Cornell University, 17 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/17/ontario-county-first-network-find/>

Carroll, J. Suffolk County sustained capture. Spotted Wing Drosophila. Cornell University, 17 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/17/suffolk-county-sustained-capture/>

Carroll, J. Washington County first find. Spotted Wing Drosophila. Cornell University, 15 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/15/washington-county-first-find-2/>

Carroll, J. 2016 monitoring network. Spotted Wing Drosophila. Cornell University, 15 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/15/2016-monitoring-network-in-ny/>

Carroll, J. Suffolk County first find. Spotted Wing Drosophila. Cornell University, 13 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/13/suffolk-county-first-find/>

Carroll, J. Ontario County first find. Spotted Wing Drosophila. Cornell University, 13 June 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/06/13/ontario-county-first-find-2/>

Carroll, J. Lure test results for SWD traps. Spotted Wing Drosophila. Cornell University, 3 May 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/05/03/lure-test-results-for-swd-traps/>

Carroll, J. Exclusion netting against SWD. Spotted Wing Drosophila. Cornell University, 19 April 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/04/19/exclusion-netting-against-swd/>

Carroll, J. SWD IPM Working Group – save the date! Spotted Wing Drosophila. Cornell University, 12 April 2016. Web. Accessed 8 July 2016.
<http://blogs.cornell.edu/swd1/2016/04/12/swd-ipm-working-group-save-the-date/>

Carroll, J. SWD Stakeholder Survey. Spotted Wing Drosophila. Cornell University, 31 March 2016. Web. Accessed 7 April 2016.
<http://blogs.cornell.edu/swd1/2016/03/31/swd-stakeholder-survey/>

Communication(s):

Web Sites -

Spotted Wing Drosophila, Cornell Fruit Resources. www.fruit.cornell.edu/spottedwing/

Spotted Wing Drosophila, Latest information from the NYS IPM Program.
blogs.cornell.edu/swd1/

Eastern Spotted Wing Drosophila Volunteer Monitoring Network (SWD*VMN).
www.eddmaps.org/swd/

Web Pages -

Crops of concern and wild hosts, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/cropshosts.html

Monitoring, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/monitoring.html

Identification, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/ID.html

Management, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/mgmt.html

Distribution map, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/dist.html

Economic and environmental impact, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/ecoenvimp.html

Biology and life cycle, Spotted Wing Drosophila, Cornell Fruit Resources.
www.fruit.cornell.edu/spottedwing/bio.html

Presentation(s):

Spotted Wing Drosophila: A Threat to Berries and Stone Fruit, Winter Fruit School, Lake Ontario Fruit Program, Lockport, NY, 2/1/2016, 0.5 hours, presenter, fruit growers, 147

Spotted Wing Drosophila: A Threat to Berries and Stone Fruit, Winter Fruit School, Lake Ontario Fruit Program, Lockport, NY, 2/2/2016, 0.5 hours, presenter, fruit growers, 113

Spotted wing Drosophila update: hummingbird use, monitoring network, Cornell Fruit Field Day, Fruit PWT, Geneva, NY, 7/20/2016, 0.33 hours, 70

Project Conclusion:

**Other External
Funding to Continue:**